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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/541,776 | 07/08/2005 | Toshihiko Ohashi | 0216-0516PUS1 | 1474 |

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| EXAMINER | |
|---|---|
| CHANG, VICTOR S | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1794 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 06/04/2009 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/541,776 | OHASHI ET AL. | |
| | Examiner | Art Unit | |
| | VICTOR S. CHANG | 1794 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *24 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3,5 and 7-16* is/are pending in the application.

4a) Of the above claim(s) *7-13 and 16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5,14 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Introduction*

1. Applicant's amendments and remarks filed on 4/24/2009 have been entered. Claims 1, 14 and 15 have been amended. New claim 16 has been entered.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. In response to the amendments, for the reasons set forth below, the grounds of rejection have been withdrawn, and to be reinstated, if appropriated.

### *Election/Restrictions*

4. Since new claim 16 relates to nonelected species A(b), see reply filed 9/11/2006, claim 16 is withdrawn. Claims 1, 3, 5, 14 and 15 are active.

### *Rejections Based on Prior Art*

5. Claims 1, 3, 5, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lange et al. [US 4816333] in view of Takahashi et al. [US 6251523].

Lange's invention [col. 2, lines 36-42; col. 3, lines 7-10; col. 4, lines 11-55; Examples 1 and 13] relates to an antireflective polymeric or glass substrate having a porous silica coating thereon. The porous coating comprises a continuous gelled network of voids between the silica particles. The gelled network is formed from a colloidal solution of silica particles. When dried, the silica coating has an open porosity of about 25 to 70 percent, and has a refractive index

between 1.20-1.30. The average primary particle size of the colloidal silica particles is less than 200 Å (20 nm), preferably less than about 70 Å to achieve good adhesion (abrasion resistant) of the coating to the substrate and antireflection properties. Fig. 2 illustrates the antireflective property of a silica coated polyethylene terephthalate (PET) film.

For claims 1 and 3, Lange lacks a teaching of making an antireflection coating from a colloidal solution comprising chain silica fine particles (moniliform silica strings). However, Takahashi's invention relates to a coating on glass windows having small reflectivity (antireflection) at high incident angle for an improved visibility. The coating is formed from a colloidal solution comprising chain silica fine particles and 5 to 30 wt% silica (colloidal forming hydrolysable silane) based on the weight of said chain silica fine particles [col. 1, ll. 55-61]. Space (void or pore) is formed between the mutually adjacent chain silica fine particles in the coating. The coating has a refractive index of 1.25 to 1.40. Dents and projections caused by the chain silica fine particles are formed on the surface of the coating [col. 1, ll. 66 through col. 2, ll. 8]. A large number of gaps of 5 to 20 nm width are formed between the adjacent chain fine particles in the coating. These large numbers of gaps have exceedingly large gross volume in comparison with the gaps made on supposition of using the same amount of spherical silica fine particles in place of the chain silica fine particles. The low refractive index of the coating approaches the theoretical value (1.225) required for obtaining zero reflectance for glass substrate [col. 2, ll. 20-37]. The void volume (porosity) of the coating is between 50 to 80% [col. 2, ll. 48]. The size of the chain silica fine (primary) particles is preferably of an average diameter of 10 to 20 nm and an average length of 60 to 200 nm. The silica dent and projection film is formed by drying at a temperature in the range of room temperature to 200°C for 1 minute

to 2 hours [col. 7, ll. 28-30]. It would have been obvious to one of ordinary skill in the art to modify Lange's coating with Takahashi's chain silica fine particles, motivated by the desire to obtain a coating with an improved low reflectance approaching zero, i.e., an improved antireflection. Regarding the hardness, minimum reflectance and the equation describing the structural relationship between various structural elements of the coating, since the collective teachings of prior art render the general structure and composition, and the process of making of the claimed invention obvious, these properties are deemed to be obvious routine optimization to one skilled in the art, motivated by the desire to obtain the required properties for the same end use as the claimed invention.

For claim 5, Lange teaches the same PET substrate for the same use as the instant invention. The hardness of the substrate is deemed to be inherent to the PET film.

For claims 14 and 15, since they are of the same scope as claims 1 and 3, they are also rejected for the same reasons as set forth above. Regarding the product-by-process limitations, since they have not been shown on the record to produce a patentably distinct article, the formed articles are rendered prima facie obvious, and the process limitations at the present time have not been given patentable weight.

***Response to Argument***

6. Applicants argue at Remarks page 10:

> "the silica-containing laminated structure of the present invention is excellent in respect of both optical characteristics and strength, which could not be simultaneously improved by the conventional techniques. As apparent from claim 1 of the present application, such excellent characteristics are achieved due to the use of a coating composition produced by mixing a dispersion of moniliform silica strings having a specific dimension with a hydrolysable silane, which coating composition contributes to the formation of the above-

> mentioned specific pore structure of the porous silica layer. This is quite unexpected because, as taught at col. 5, lines 28 to 36 of Lange et al., it has conventionally been believed that the "particle agglomeration prior to preparation of the coating composition" should be prevented."

However, applicant's argument directed to Lange individually ignores that the basis of rejection is the collective teachings of Lange and Takahashi as set forth above. Since Takahashi teaches the use of chain silica fine particles (moniliform silica strings), the collective teachings renders the general structure and composition of the antireflection coating, and the process of making of the claimed invention obvious. In particular, Takahashi teaches the forming of a large number of gaps of 5 to 20 nm width are formed between the adjacent chain fine particles in the coating, and the resulting coating has a low refractive index of the coating approaching the theoretical value (1.225) required for obtaining zero reflectance for glass substrate. Applicants' argument directed to Lange individually is unpersuasive.

Applicants argue at page 13:

> "Lange et al. use a polymeric substrate (see, for example, col.2, line 36 to 37 of Lange et al.). Needless to say, if the silica particles in a coating formed on a polymeric substrate are sintered at a temperature as high as 500 °C for as long as 1 hour, the polymeric substrate is markedly deteriorated. In fact, in the Examples of Lange et al., the coatings formed on polymeric substrates are dried at relatively low temperatures for a short time, e.g., 100 ° for 2 minutes or 93 °C for three minutes (col. 6, line 24 to 27, and lines 65 to 68 of Lange et al.)"

However, Takashashi teaches that the silica dent and projection film is formed by drying at a temperature in the range of room temperature to 200°C for 1 minute to 2 hours. Since PET inherently has a glass transition temperature greater than 200°C, the prior art references are combinable. Further, since Lange teaches that the substrate can be polymeric or glass, the collective teachings are reasonably expected to be successful.

Applicants argue at pages 13-14:

> "in Takahashi et al., the optical characteristics of the silica coating are poor compared to those of the present invention. More specifically, in the Examples of Takahashi et al., the reflectance (%) (at a wavelength of 550 nm) is measured only in the "First Embodiment", the "Sixth Embodiment" and the "Seventh Embodiment". The reflectance values in the First Embodiment, the Sixth Embodiment and the Seventh Embodiment are 0.8 %, 0.7 % and 2.2 %, respectively (see Table 3 at col. 11 and Table 9 at col. 16 of Takahashi et al.), which are much higher than the upper limit (0.45 %) recited in claim 1 of the present application.
> The reason for this is considered to reside in that the specific pore size distribution (represented by formula (1) shown in claim 1 of the present application) is not satisfied in Takahashi et al. Further, the difference in such pore size distribution between the present invention and Takahashi et al. is considered to reside in that, in Takahashi, the silica coating is formed under the above-mentioned very high temperature conditions which are inapplicable to the present invention in which a transparent thermoplastic resin substrate is used."

However, Takahashi's invention is not limited to the results in the Examples. Since the collective teachings of prior art render the general structure and composition, and the process of making of the claimed invention obvious, the minimum reflective property is deemed to be an obvious routine optimization to one skilled in the art, motivated by the desire to obtain the required antireflection for the same end use as the claimed invention.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VICTOR S. CHANG whose telephone number is (571)272-1474. The examiner can normally be reached on 7:00 am - 5:00 pm, Tuesday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Victor S Chang/
Primary Examiner, Art Unit 1794